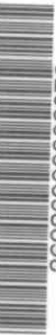


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THE ONTARIO WATER RESOURCES COMMISSION

REPORT ON

Stream Pollution
in the
County of Oxford

BY:

K. H. Sharp and G. Samuel

DATE:

September 1958

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A REPORT
on
Stream Pollution in the County of Oxford

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STREAM POLLUTION IN THE COUNTY OF OXFORD

A re-survey of water pollution in Oxford County was carried out to determine what corrective measures had been taken by municipalities and industries contributing to the pollution of county watercourses. The survey also included more detailed investigations of some sanitary conditions in the various municipalities. Certain industries that were not investigated in September 1957, were visited to determine the methods employed for the treatment of industrial wastes.

Representatives of the Commission were given the utmost assistance by Dr. O.C. Powers, Director of the Oxford County Health Unit and members of his staff.

Studies of the various sources of pollution will continue throughout the County of Oxford along with regular sampling of streams.

Interpretation of Analyses

For convenience in the interpretation of laboratory analyses it may be taken as an objective that pollution in streams should not exceed the following figures. --

B.O.D. (Biochemical Oxygen Demand)	4 ppm (parts per million)
Coliform Counts (M.P.N.- Most Probable Number)	2400/100 ml

Similarly, the effluents from drains or sewage plants should have, as objectives, figures not in excess of the following --

B.O.D.	15 ppm
S.S.	15 ppm

REPORTS ON MUNICIPALITIES

EAST NISSOURI TOWNSHIP

Uniondale Cheese Factory - R.R. No.1, Lakeside

Mr. H. Frazer, factory owner and operator, advised that the manufacturing of cheese had been reduced and that the plant was receiving approximately 15,000 pounds of milk per day.

Treatment of Wastes - The method of waste disposal was similar to the one reported following an inspection in September 1957. Whey is separated from other plant wastes and is returned to the farms or removed by tank-truck to a gravel pit. Wastes resulting from cleaning operations are discharged into a four compartment septic tank, through field tile to a creek. This creek joins the north branch of the Thames River in Middlesex County. There was evidence of milk wastes at the factory drain outfall. A separate septic tank and field tile system is employed for the disposal of sanitary wastes.

Summary - It was noted that no steps had been taken to provide adequate treatment of plant wastes. Mr. Frazer indicated that he would consider the adoption of a spray irrigation system for the disposal of wastes. Samples were again obtained at the plant drain outfall and at the receiving stream.

Here are the analyses:

	<u>B.O.D.</u> (ppm)	<u>Solids</u> <u>Total Susp. Diss.</u> (ppm)			<u>Coliforms</u> (M.P.N.)
No. 1 Above Cheese Factory Drain	9.6	328	8	320	240
No. 2 Below Cheese Factory Drain	1.1	384	84	300	2,400

These results indicate that a substantial amount of pollution exists in the vicinity of the cheese factory drain.

Homestead Dairy - R.R. No. 3, Thamesford

This cheese company has discontinued the making of cheese, and manager A.C. Carter advised that milk received at the plant was being shipped to other centres.

Treatment of Wastes - Plant wastes are discharged through a three-compartment septic tank with two compartments being 9' x 9' x 6' and the third section 5' x 12' x 5' approximately. The drain from the septic tank discharges into a watercourse which eventually flows into the middle branch of the Thames River. Pollution of the water course at the factory drain outfall was evident.

Summary - The possibility of introducing a spray irrigation method of waste disposal was discussed with Mr. Carter. This should be introduced without delay to prevent the pollution of the stream as indicated in the analyses.

Here are the analyses:

	<u>B.O.D.</u> (ppm)	<u>Solids</u> <u>Total Susp. Diss.</u> (ppm)			<u>Coliforms.</u> (M.P.N.)
Factory Drain Effluent	920	2318	1782	536	24,000,000 +

Thamesford

An investigation of possible sources of pollution in the Police Village was carried out. These included the village storm drain and a chicken killing plant. However, there was no indication of pollution at this time.

WEST ZORRA TOWNSHIP

Bennington Cheese Factory - R.R. No. 3, Embro

The factory is presently engaged as a milk receiving station, and cheese is not being manufactured. Manager Ross McColl, advised that there had been no change in the method of waste disposal.

Treatment of Wastes - Wastes resulting from cleaning operations are discharged to three separate concrete tanks, each 6' x 5' x 5', which in turn discharge through a drain into Bennington Creek. The creek was grossly polluted at the factory drain outfall. Sanitary wastes are discharged into a separate septic tank and field tile system.

Summary - Laboratory examination of samples obtained at the creek, and the effluent from the cheese factory drain indicated a high degree of pollution.

Here are the analyses:

	B.O.D. (ppm)	Solids Total Susp. Diss. (ppm)		Coliforms (M.P.N.)
No.3 Creek above factory drain				24,000
No.4 Creek below " "				24,000,000 +
Factory Drain Effluent	600	782	300 482	

It is suggested that the cheese company give consideration to the adoption of the spray-irrigation type of waste disposal without undue delay. Pollution of Bennington Creek should not be permitted to continue.

Red Star Cheese Factory - R.R. No. 4, Ingersoll

Manager H. Stockman was not available at the time of inspection. The factory is now a milk-receiving station, and it is unlikely that the manufacture of cheese will be carried on in the future.

Disposal of Wastes - Sanitary and industrial wastes are discharged directly into the Thames River.

Summary - Samples were not obtained due to the fact that there was no discharge from the plant during the inspection. It was noted that there had been no change in the method of waste disposal since the last visit. It is recommended that an approved method of waste disposal be introduced as early as possible to prevent the continued pollution of the Thames River.

Canada Cement Company Limited - Plant No. 4, Woodstock

Mr. H.W. Hamilton, Plant Superintendent, was not available during the inspection of the plant drain. Samples obtained during previous visits have shown heavy turbidity. Further samples were obtained from the drain at the outlet to the Thames River and submitted to the Commission laboratory for examination. The analyses revealed:

<u>B.O.D.</u> (ppm)	<u>Solids</u>		<u>Turbidity</u> (ppm)	<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp. Diss.</u> (ppm)		
13	1064	36 1028	21	2,400

The B.O.D. result exceeds OWRC figures, which was given as 4 ppm for B.O.D.

Embro

Mr. J. Griffith, Sanitary Inspector with the Oxford County Health Unit, reported that several premises in the village were discharging domestic waste into the storm drains. The health official had been successful in eliminating several illegal connections to the drain but investigations were continuing. Pollution problems were also reviewed with Mr. Ross Smith, Embro village clerk. There are two storm drains in the village. One contained drainage from the east side of the village and discharged into a watercourse on the west side of the highway and at the north end of the village. The second storm drain discharged into the same watercourse. During the time of inspection the drain from the east side of the village contained what appeared to be domestic wastes accompanied by a strong sewage odour. The other drain did not have any flow.

Slaughter House - Operation and Disposal of Wastes -

Mr. L.A. Brenneman was interviewed. Animals are slaughtered on the premises and the meat is sold at the owner's butcher shop at Embro.

Disposal of Wastes - Wastes resulting from cleaning operations are discharged to a concrete tank. The outlet from the tank to the Thames River was reported to have been blocked to prevent pollution of the stream from this source. The wastes in the tank are pumped into a tank truck and taken for final disposal to farmland. Other wastes from the slaughter house are either shipped to a fertilizer plant or disposed of on farmland.

Summary - Complaints had been received by the Oxford County Health Unit of wastes from the plant being discharged into the Thames River. Inspections will be carried out by officials of the Health Unit to ensure that the slaughter house wastes will not be discharged into the river in the future.

Refuse Dump -

The local refuse dump situated just north of the village was investigated. No pollution problem exists at the present time. However, it is recommended that local officials take steps to ensure proper supervision of the dump, and that it be kept a safe distance from a creek in the area.

Summary on Embro -

Samples were obtained at the village drain and at points on the receiving stream. The analyses revealed:

	B.O.D. (ppm)	Total Solids (ppm)	Susp. Diss.	Coliforms (M.P.N.)
Village drain at Outlet	40	642	38 604	2,400,000
Village drain at River	1.5	304	6 298	24,000

Middle Branch, Thames River

	<u>Mileage</u>	<u>Place</u>					
T.M.B.	164.4	Bennington Creek	0.8	446	20	426	240
T.M.	162.7	N. of Embro	1.0	406	12	384	2,400
T.M.	161.3	S. of Embro	0.5	436	50	386	2,400

It is evident from the results of samples obtained at the village storm drain outlet and at the river, that sanitary wastes are being discharged into the municipal storm drains. Investigation of private connections to these drains should continue until pollution of the Thames River at Embro has been eliminated.

EAST ZORRA TOWNSHIP

Tavistock -

Domestic and industrial wastes are being discharged from the village of Tavistock into the south branch of the Thames River. The main storm drains were investigated, as well as three local industries, the Tavistock Cheese and Butter Company, J.G. Field and Company Limited, and the Tavistock Dairy to determine the methods of waste disposal employed at the plants.

Tavistock Storm Sewers - The storm drainage system in the village was reviewed with Mr. R. Rudy, Reeve, and Mr. C.J. Kilne, clerk. There are three main storm drains in Tavistock discharging into the South branch of the Thames River. These are:

No. 1 - an open drain flowing from the old railroad in the south west section of the village. This drain receives wastes from the Tavistock Dairy, the Tavistock Cheese and Butter Company and two storm sewers draining from the south west section of the village.

No. 2 - a storm sewer which extends through the memorial park and eventually flows into No. 1 drain.

No. 3 - this is an open drain in the east section of the village which receives wastes from the J.G. Field Company and from private

premises. This drain flows through the Ramsayer farm and eventually to the south branch of the Thames River. Several samples were obtained at the storm drains and these revealed:

<u>Place</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
		<u>Total</u>	<u>Susp.</u> (ppm)	<u>Diss.</u>	
Storm sewers discharging into No.1 drain					
Outfall N.W. side of Hwy.19	3.7	376	6	370	2,400,000
" N.E. " " " "	100	718	52	666	24,000,000
No.1 drain south of Hwy.19	7.6	422	16	406	240,000
No.2 drain at Memorial Park (taken from manhole)	96	598	76	522	2,400,000
No.3 drain above Field Co. drain	390	838	182	656	2,400,000
No.3 drain near Ramsayer farm	4	464	6	458	24,000

Tavistock Cheese and Butter Company

At the time of inspection cheese was not being manufactured, and milk received at the plant was being shipped to other centres.

Disposal of Wastes - Wastes from the plant enter a catch basin and discharge through a drain into an open ditch 150 yards north east of the factory. This ditch flows into an open drain and eventually into the south branch of the Thames River. A septic tank and field tile system is employed for sewage disposal.

Summary - There has been no change in the method of waste disposal. Consideration is being given to the installation of a spray irrigation system for the treatment of plant wastes. The condition of the creek at the drain outfall indicated gross pollution. Samples obtained at the drain outfall revealed:

<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
660	1018	204	814	24,000

A satisfactory method of waste disposal should be adopted without further delay.

J.G. Field and Company Limited

Mr. T. Mallon, plant foreman, was interviewed. It was reported that plain wollen socks were being manufactured, with no dyeing involved. The plant water consumption was estimated at approximately 4,000 gallons per day.

Disposal of Wastes - There has been no change in the method of waste disposal at the plant. A septic tank and field tile system was being used for the treatment of sanitary wastes. Trade wastes were discharged into a two-compartment concrete settling tank, 24' x 12' x 6'. The tank is cleaned out at regular intervals and the solids disposed of on the property.

Summary - Samples of the trade wastes from the plant revealed that the treatment provided at the plant was inadequate.

Here are the analyses:

<u>B.O.D.</u> (ppm)	<u>Solids</u>		<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp. Diss.</u>	
824	2586	666 1920	240,000

Tavistock Dairy

This milk pasteurization plant is operated by Mr. M. Leis, who supplied information regarding the disposal of wastes.

Disposal of Wastes - The volume of water used at the plant could not be estimated. Wastes resulting from cleaning operations are discharged through the plant sewer to an open drain.

Summary - Laboratory examination of the plant wastes indicated that heavy pollution of the receiving watercourse was taking place.

Here are the analyses:

	<u>B.O.D.</u> (ppm)	<u>Solids</u>		<u>Coliforms</u> (M.P.N.)
		<u>Total</u>	<u>Susp. Diss.</u>	
Dairy Effluent	1,000	1062	276 786	2,400,000

It is recommended that the operator of the dairy give consideration to the introduction of a spray irrigation method of wastes disposal. This should not prove too difficult in view of the adequate land space available.

Summary of Tavistock - The survey revealed that private premises and industries were responsible for the pollution of watercourses flowing from the Village of Tavistock to the south branch of the Thames River. Pollution was particularly evident at the storm drain south of Tavistock and on the north east side of Highway 19, at the drain flowing through the Memorial Park, and at the drain flowing from the east end of the municipality.

Hickson

It was reported that certain private dwellings in the municipality were discharging sanitary wastes into two Department of Highways' drains, which in turn discharges into a watercourse. The Borden Company plant was also found to be contributing to the pollution of

the watercourse.

Slaughter House - Operation and Disposal of Waste

It was reported in September, 1957, that wastes from the slaughter house were permitted to be discharged into a Department of Highways' storm water drain. Since that time, Mr. G. Rudy, the owner, has enlarged the field tile system with the result that wastes from the establishment are not being discharged to the storm water drains.

Borden Cheese Company

Mr. Fullick, plant manager, reported that all milk received at the plant was sent to other centres.

Disposal of Wastes - Wastes resulting from cleaning operations are discharged to a creek which eventually flows into the south branch of the Thames River. Samples were obtained at the creek and the factory drain outlet. The analyses revealed:

<u>Place</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
					(ppm)
No. 10, 50 yds. above factory drain					2,400,000 +
No. 11, 75 yds. below factory drain	69	568	60	508	240,000
Plant Effluent	158	592	66	526	2,400,000 +

Summary - There has been no improvement in the method of waste disposal at the plant. Pollution of the creek should be prevented with the adoption of an approved method of treatment of the milk wastes.

Summary on Hickson

Two sources of pollution were revealed in Hickson--

- (1) Domestic wastes from private homes entering the storm drains.
- (2) Wastes from the Borden Company milk receiving plant discharging into the creek.

Laboratory examination of the effluent from one of the storm drains reveals:

<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
		(ppm)		
27	620	222	398	240,000

Health officials are continuing investigations in an effort to eliminate all private connections to storm drains. The analyses of

the samples obtained at the Department of Highways' drain outfall suggest that sanitary wastes are still being discharged into the drain.

Innerkip

The municipality does not seem to have a pollution problem. Samples taken from the Thames River two miles south of Innerkip revealed:

	B.O.D. (ppm)	Solids Total Susp. Diss. (ppm)			Coliforms (M.P.N.)
T 166.2	2.5	484	54	430	240

Cassel

Investigations revealed that pollution of the south branch of the Thames River took place as a result of wastes discharged from the Cassel Cheese and Butter Company.

Cassel Cheese and Butter Company, R.R. #1, Tavistock:

Manager Walter Kaufman reported that no improvement had been made in the method of waste disposal.

Disposal of Wastes - A septic tank and field tile disposal system is used for the treatment of sewage from the plant. Whey is returned to the farms. Other industrial wastes discharge through a two-compartment septic tank, approximately 14' x 8' x 6'. This discharges into a drain which in turn flows into the Thames River, directly south of the plant. Samples were obtained for bacteriological and sanitary chemical analyses.

Place	B.O.D. (ppm)	Solids Total Susp. Diss. (ppm)			Coliforms (M.P.N.)
Factory drain effluent	1,560	7328	4024	3304	2,400,000 +
No. 18 75 yds. above plant outlet	9	404	92	313	2,400,000
No. 17 3/4 mile below plant outlet	1.8	350	36	314	240

Summary - Gross pollution of the Thames River was evident at the cheese factory drain outlet. Immediate steps should be taken to introduce the spray irrigation type of waste disposal or some other satisfactory method.

German Union Cheese Factory, R.R. #1, Tavistock:

The plant is engaged in the manufacture of cheese. Mr. C. Stockman, plant manager, gave information regarding the disposal of plant wastes.

Disposal of Wastes - Sewage disposal is by means of a septic tank and field tile system. Whey is returned to the farms while

other trade wastes are discharged to a three-compartment septic tank and through a drain to a tributary of Horner's Creek.

Laboratory examination of the plant effluent revealed -

<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
	(ppm)	(ppm)	(ppm)	
2,900	2012	156	1856	240,000

Bacteriological analyses of samples taken from the receiving watercourse revealed -

	<u>Coliforms</u> (M.P.N.)
No. 14 - 50 yd. above factory drain	240,000
No. 15 - 50 yd. below factory drain	2,400,000

Summary - The cheese factory continues to be a major source of pollution. A satisfactory method of waste treatment such as a spray irrigation system should be introduced without delay.

BLANFORD TOWNSHIP

Bright:

Samples were obtained from Horner's Creek in the Bright area. Laboratory examinations revealed:

	<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
		(ppm)	(ppm)	(ppm)	
No. 20 Horner's Creek at Hwy.69	4.6	422	130	292	2,400
No. 19 Horner's Creek below junction of creek from Bright	1.2	396	10	386	24,000

Bright Cheese and Butter Company:

The company has installed a spray irrigation system of waste disposal. Permission has been granted to spray plant wastes on a field adjacent to the factory. However, if this practice proves to have an adverse effect on the pasture, permission to use the land will be removed.

Disposal of Wastes - A septic tank and field tile system is employed for sanitary sewage disposal, while the other wastes are sprayed on the land. Cooling water is discharged directly to the factory drain and into a watercourse. During the inspection, about

two acres of land was being used for the spray irrigation. Two sprays had been installed and these were to be alternated every other day.

Summary - The spray irrigation system of waste disposal had been in operation for only one day. A further inspection will be carried out in the future. Installation of the equipment was incomplete at the time of the inspection.

BLENHEIM TOWNSHIP

Plattsville:

A survey of the area revealed two possible sources of pollution, namely: the Canada Sand Paper Company and the storm drain.

Canada Sand Paper Company:

The system of waste disposal was reviewed with Mr. S. Green, plant manager.

Disposal of Wastes - A septic tank and field tile system is employed for the treatment of sanitary wastes. Industrial wastes include dyes, abrasives and glue. The two 500 gal. dye tanks used at the plant are discharged at certain intervals into the municipal storm drain. When this occurs 500 gallons of water per minute is discharged with the industrial wastes. It was not possible to determine what effect the dilution practice had on the quality of the wastes since operations had been completed for the day. It will be necessary to re-visit the plant during a period of operation to obtain samples for chemical analysis. However, samples were obtained on the plant property.

Here are the analyses:

	<u>B.O.D.</u> (ppm)	<u>Solids</u> <u>Total Susp. Diss.</u> (ppm)			<u>Coliforms</u> (M.P.N.)
At manhole in plant yard	5.6	2104	104	2000	240,000
Municipal drain below plant	5.6	2072	72	2000	240,000

Summary - It will be necessary for representatives of the OWRC to investigate the Canada Sand Paper Company at a time when dye, and other trade wastes are being discharged to determine the quality of the plant effluent.

Storm Drain:

A watercourse, which is partly tiled, serves as a municipal storm drain. The drain flows through the Canada Sand Paper Company and into the Nith River directly south of the plant. Samples were obtained for bacteriological and sanitary chemical analyses at a manhole above the Canada Sand Paper plant. The results revealed:

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	
9.4	922	270	652	2,400

Other samples obtained from the Nith River in the Plattsville area revealed:

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	
No. 25 - Nith River East Br. N. of Plattsville 0.6	306	14	292	240
No. 22 - East Branch, South of Plattsville 4.4	354	44	310	2,400
No. 25 - West Branch before junction with East Br. 2.4	382	12	370	2,400
No. 26 - Nith River below junction 3.2	384	20	364	240

Washington:

The analyses of samples taken from the Nith River in the Washington area are to be found at the end of this report. The bacteriological results suggest the presence of pollution as a result of private drains discharging into the stream.

Drumbo:

It was reported that private dwellings were discharging wastes into the municipal drain which flows into Burgess Lake. Samples were obtained, with the following results:

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	
Drumbo Storm Drain 2.9	436	44	392	2,400
No. 34 Creek from Burgess Lake				2,400

Princeton:

There did not appear to be pollution problems in the municipality. However, a sample obtained from Horner's Creek near Princeton revealed:

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	
3.4	502	8	494	24,000,000

NORWICH NORTH AND DEREHAM TOWNSHIPS

Two industries, Donland's Dairy, Oxford Limited, R.R. #1, Burgessville, Dereham Township and York Farms Limited, Pea Vining Station, 1st Concession, Norwich North Township were re-investigated.

Donland's Dairy, Oxford Limited:

Mr. F. Gillies reported there had been no change since the inspection carried out by representatives of the Commission in September 1957.

Disposal of Wastes - A septic tank and field tile system was employed for sewage treatment, while wastes resulting from cleaning operations are discharged through a three-compartment concrete tank. Wastes from the tank are discharged through a drain into a watercourse approximately $1\frac{1}{2}$ miles north-east of the plant. The amount of milk received at the plant had been increased to approximately 27,000 pounds per day. No samples were obtained at this time since there was no flow in the factory drain.

Summary - It was established that the company plant contributes to the pollution of Sweaborg Creek. A satisfactory system of waste disposal such as spray irrigation, should be introduced at the dairy without further delay.

York Farms Pea Vining Station, Norwich North Township:

Operations at the pea vining station were discontinued at the end of the 1957 season. A pea stack remains, but there was no seepage to a watercourse.

Summary - This does not appear to be a source of pollution at the present time.

WOODSTOCK

Sampling of the Thames River in the vicinity of Woodstock, Beachville and Ingersoll was carried out during the survey. The analyses are listed at the end of this report.

Sewage Treatment Plant:

A summary of the results on samples obtained from the sewage treatment plant indicates that the effluent was generally satisfactory.

Beachville:

Industries in the Beachville area were re-visited.

Chemical Lime Limited:

Mr. G. Bowlby, company manager, was interviewed.

Operations - The company is employed in the production of quick-lime. A considerable amount of water is pumped from the

quarries into a ditch and settling pond.

Summary - There was no discharge from the company property into the Thames River, and, consequently, no samples were taken. It was noted, however, that the water in the settling pond was quite clear. Arrangements will be made to obtain samples at a time when the plant is discharging quarry effluent into the stream.

North American Cyanamide Limited:

Mr. J. Milne, a company engineer, supplied information.

Operations - Agricultural and Industrial Limestone is produced. Flood water from the quarries is discharged into a watercourse which discharges into the Thames River approximately $\frac{1}{2}$ mile from the quarries.

Summary - There was no discharge from the company drain during inspection. Samples will be obtained at an early date.

Gypsum, Lime and Alabastine (Canada) Limited:

Mr. J.H. Robinson of the company was interviewed in the absence of manager, W.T. Unsworth.

Operations - The company produces industrial lime and limestone. Samples of the effluent from the company quarries were submitted to the Commission's laboratory. The analyses revealed:

B.O.D. (ppm)	Solids		Turbidity (ppm)
	Total	Susp. Diss.	
		(ppm)	
2.2	630	34 596	9

Summary - Further sampling of the outlets from the company quarries would be desirable. The sample obtained during the inspection indicates that the Suspended Solids are somewhat higher than the desired OWRC standard.

Neilson Company:

Mr. M. Jameson, plant manager, was interviewed and advised that the plant is engaged in the spray drying and condensing of milk.

Disposal of Wastes - It was estimated that wastes resulting from cleaning operations were being discharged directly into the south branch of the Thames River at a rate of 2,000 gallons an hour for an eight hour day. Clear waste water from the plant has been separated from the plant drain and is discharged into the Thames River. Samples of the plant waste were submitted to the Commission's Laboratory for examination:

Here are the analyses:

<u>B.O.D.</u> (ppm)	<u>Solids</u>		<u>Diss.</u> (ppm)	<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp.</u>		
680	666	216	450	24,000,000 +

Summary - Mr. Jameson reported that various methods of waste disposal were being studied. The lack of land space in the vicinity of the plant had added greatly to the problem. However, pollution of the Thames River in the vicinity of the milk plant should not be permitted to continued.

INGERSOLL

An investigation of possible sources of pollution in the Town of Ingersoll included an inspection of the methods of waste disposal in certain industries that were not served by the municipal sewage system. Storm sewers in the town were located and samples were obtained at the outlets. Many premises are still served by septic tank and field tile systems. There was also evidence of private sewer connections to the town's storm drains. It is suggested that municipal officials renew efforts to have all homes on sewerred streets connected to the sanitary sewers.

Industrial Waste Disposal - The survey revealed that several industries were discharging partially treated and untreated trade wastes into the Thames River. The Industrial Wastes Division of the OWRC is continuing its investigations of the town's industries.

W.M. Stone and Sons Limited - The rendering operations are to be transferred to the Darling Company of Canada in Chatham. Mr. G. Pittock of the company reported that all operations would be completed in August, 1958. Future plant activities will include dry mix fertilizer and feed concentrate manufacturing.

Summary - Pollution problems are not anticipated in the future.

Morrow Screw and Nut Company - The methods of waste disposal were reviewed with Mr. J.B. Mitchell, Works Manager. Manufacturing of machinery products is carried on at the four company plants.

Disposal of Wastes - Plants No. 1 and No. 3 are engaged in cadmium and zinc plating work. Wastes from these plants are discharged to a private plant drain with an outlet to the Thames River. Samples obtained at the outlet revealed:

<u>B.O.D.</u> (ppm)	<u>Solids</u>		<u>pH</u>	<u>Phenol</u> (ppb)	<u>Cyanides</u>	<u>Ether</u> <u>Solubles</u>	<u>Coliforms</u> (M.P.N.)
	<u>Total</u>	<u>Susp.</u>					
6.2	590	46	7.6	30	6.5	27.2	2,400

Plant No. 2 may discharge oil and caustic wastes to the Thames River during periods of operation. Operations were not being carried out at the time of inspection.

Plant No. 4 discharges acid wastes which are treated by settling and application of lime. The settling tank which is located at the rear of the plant is emptied on occasions, and the waste materials are removed to a dump by a tank truck. There was an insufficient flow in the plant drain to obtain a sample for chemical analysis. However, the discolouration in the area of the drain outlet suggested that harmful wastes are discharged into the river.

Reference is made to a cyanide dump located at the rear of Plant No. 2. The distance from the dump to the river is approximately 200 yards.

Summary - It is recommended that further investigations of the disposal of wastes at this plant be carried out by the OWRC's Industrial Wastes Division. The results of the sample obtained at the drain outlet from Plants 1 and 3 indicated that harmful wastes, such as phenol, cyanides, and oil were being discharged into the Thames River. Cyanides should not be discharged into a watercourse while phenol and oil wastes should be treated to meet the OWRC standard.

Oxford Dairy:

The milk pasteurization plant is owned by Mr. A. Wilson. Plant officials were not available at the time of inspection.

Disposal of Wastes - Industrial wastes are discharged to the Thames River. Samples of the wastes were submitted to the Commission's Laboratory for examination.

The analyses:

B.O.D. (ppm)	Solids		Coliforms (M.P.N.)
	Total	Susp. Diss.	
(ppm)			
Broken in transit.			240,000

Summary - It is contrary to the requirements of the Ontario Water Resources Commission Act to discharge harmful wastes to a watercourse. Arrangements should be made with the municipality to have the dairy wastes included in the municipal sewerage system. At present the plant sanitary wastes are being discharged to the town sewers.

Ingersoll Cheese Company Limited:

The company is engaged in the processing of cheese and the manufacturing of margarine. Mr. B.A. Higgins, plant superintendent outlined the method of waste treatment.

Disposal of Waste - Sanitary wastes are discharged into the municipal sanitary sewers. Industrial wastes resulting from the manufacturing of margarine and cleaning operations are discharged

to two steel grease traps, (14' x 4' x 4') in series, each tank having three compartments. Scum is removed from the tanks while the effluent drains into a two compartment septic tank (10' x 16' x 6') approximately. The tank effluent drains to the Thames River.

Summary - It will be necessary to obtain samples of the plant effluent to determine the efficiency of the treatment facilities.

The Borden Company -

An inspection was made of the company's plant by Mr. H. MacDonald, Chemical Engineer, on July 3, 1958, and samples were taken from the evaporator water and the final effluent. The following results were obtained:

Evaporator water - 17 ppm B.O.D.
Final effluent - 68 ppm B.O.D.

The evaporator water sample was composited at hourly intervals from 11 a.m. until 2 p.m. The final effluent sample was a composite of samplings at 11 a.m. and 2 p.m.

It now appears that the large quantity of B.O.D. being discharged to the Thames River is not coming from the evaporator water. This means the high B.O.D. must be due to the wash water which is discharged with the evaporator water. Although the final effluent had a B.O.D. of only 68 p.p.m., it had been found to be 2100 p.p.m. on a previous sampling. Since the flow of wash water is irregular could have very high and very low values at different times during a day. A high B.O.D. must still be discharged at intervals because the condition of the river channel has not changed. It is still very bad.

It was learned from Mr. R. Knott, plant manager, that nothing had yet been done regarding the recommendation to separate the evaporator water from the wash water. This should be done immediately so that no milk washings are discharged to the river. The wash water will have to be put into the town sewer or disposed of in a trickling filter as suggested by Mr. A. Harris of the Industrial Wastes Division.

Ingersoll Tool and Machine Company Limited:

Mr. H. MacDonald of the Commission's Industrial Wastes Division made an inspection of the plant to check on the operation of their newly installed waste treatment equipment. Both the oil separator and the sodium hypochlorite cyanide treatment are now in operation.

Grab samples of the final effluent were taken July 3 and 4, 1958 and grab samples of the effluent from the oil separator and from the cyanide treatment were taken July 4, 1958.

All samples appeared free of oil. It was raining heavily during the inspection on July 4, 1958, and only traces of oil film appeared in the effluent. The collection sump and oil separator seemed to be working effectively.

Ingersoll Storm Sewers:

An investigation of storm sewer outlets in Ingersoll was carried out to determine the quality of the effluents. It was reported that sanitary and industrial wastes were being discharged into the storm sewers. The location of the outlets together with the analyses of samples taken are listed as follows:

<u>Place</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
ST1. 1. Pemberton St. at C.P.R.	49	606	40	566	240,000
ST1. 2. Carnegie and Mutual E.side of Creek	100	652	60	592	24,000,000 +
ST1. 3. Carnegie and Mutual W. side of Creek	20	370	50	320	240
ST1. 4. George St. bridge south of Raglan west side of bridge	7.6	482	30	452	24,000
ST1. 5. Bridge at Bell St. hill on west side of town	14	622	24	598	2,400,000
ST1. 6. Bell St. at McKeand St.	13.8	698	176	522	24,000
ST1. 7. Foot of Ann St. off Merritt St.	149	966	202	764	24,000,000 +
ST1. 8. Wanham St. south rear C.P.R. (no flow)					
ST1. 9. South of Canter- bury St.	2.7	510	22	488	2,400,000
ST1. 10. At foot of Concession St. (flooded)					

Summary - The laboratory examination on the Ingersoll storm sewer effluents reveal heavy pollution in all cases, which suggests that many premises in the town are connected to the drains.

Ingersoll Summary:

Several industries in the municipality are contributing to the pollution of the Thames River. Wherever possible, industrial companies should join the town's sewerage system where wastes would be treated at the sewage treatment plant. Failing this, the industries concerned should provide their own treatment before

discharging wastes into a stream. During the survey, the following industries were found to be offenders:

The Borden Company
Oxford Dairy
Morrow Screw and Nut Company.

The Stone Fertilizer Company is discontinuing operations and should not have an industrial wastes problem in the future. The Ingersoll Machine and Tool Company has introduced a treatment system which is currently being investigated by the Commission's Industrial Wastes Division. Sampling of industrial drain outlets will continue.

The sewage treatment plant has provided satisfactory treatment over a period of time. A sanitary survey of the town revealed that large amounts of sanitary and industrial wastes were being discharged untreated into the Thames River. Immediate steps should be taken by local authorities to eliminate the sources of pollution in the municipality.

OTTER CREEK

Norwich, Otterville and Tillsonburg are the municipalities contributing to the pollution of Otter Creek.

Norwich:

It was found that domestic and industrial wastes were permitted to discharge into the Otter Creek from village storm drains and the two local industries.

West, Taylor, Bickle Company:

Mr. H.A. Hodges, Manager of the broom company, reported that steps were being taken to prevent wastes from the plant from entering the stream.

Disposal of Wastes: Mr. R.H. MacDonald of the Industrial Wastes Division visited the plant and reported on the wastes disposal problems. The company has the following dye wastes to dispose of:

1. A Broom Dye Tank (Aniline Dye) having approximately 300 gallons capacity. It is emptied two or three times per day and operates approximately three days per week.
2. A Yarn Dye Tank (Aniline Dye) having 200 gallons capacity. It operates one week per month and is dumped at the end of each week of use.
3. A Corn Dye Tank (Malochite Green) having 150 to 200 gallons capacity. It is emptied every night.

All these dye wastes are now emptied directly to Otter Creek which runs behind the plant.

The company's sanitary wastes (approximately 43 employees) go to a septic tank 12' x 7' x 5'. The effluent flows to a tile bed which is underdrained into Otter Creek. It was recommended that the company dig a disposal pit as far from the creek as possible and dump all the dye wastes into it. If the recommendation is followed it should eliminate the dye disposal problem satisfactorily.

There was no industrial waste being discharged during inspection. However, samples were taken in the vicinity of the broom factory with the following analyses:

	B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
		Total	Susp.	Diss.	
No. 52 At bridge at Main St. above broom factory	1.6	324	22	302	24,000
No. 53 Below broom factory outfall	2.2	360	42	318	24,000

Summary - At the present time both sanitary and industrial wastes are permitted to discharge into Otter Creek. Mr. Hodges, plant manager, stated that steps will be taken as soon as possible to eliminate these sources of pollution.

Canada Vinegars Limited:

Mr. S. Newton of the company was interviewed in the absence of manager M. Meredith. The plant operates from September to November, the volume of water used being estimated at 6,000,000 gallons a month.

Disposal of Wastes - A septic tank and field tile system was employed for sanitary sewage disposal. Cooling water is discharged directly to Otter Creek. The company proposes to have a spray irrigation method of treatment in operation before the beginning of the season. Industrial wastes will be discharged to a concrete tank where a separator will dispose of the heavier solids in one compartment of the tank while the other wastes will be pumped from the second section of the tank and sprayed over approximately two acres of land. There is some doubt as to whether the land will have the capacity to take the estimated volume of 50,000 gallons per day of plant wastes.

Summary - It will be necessary to re-visit the plant when the proposed disposal system has been put into operation.

Norwich Storm Sewers:

A survey of the town sewers in the village was made to determine the presence of domestic wastes. The exact locations of the drain outlets are shown on an accompanying map of Norwich. Samples were obtained at the storm sewer outlets and submitted to the Commission's laboratory for examination.

Here are the analyses:

<u>Location</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.F.N.)
		<u>Total</u>	<u>Sus.</u>	<u>Diss.</u>	
		(ppm)	(ppm)		
STN.1 North Court St., at bridge	7.2	660	36	624	240,000 ✓
STN.2 Main St., N.W. of bridge	13	572	16	556	24,000,000+ ✓
STN.3 Stover St., south side	7.6✓	530	32	498	24,000,000+ ✓
STN.4 Stover St., north side	108	660	146	514	24,000,000+ ✓
STN.5 Pitcher St.	4.3	692	34	658	24,000,000+ ✓
STN.6 Near Water St. - could not be located.					
STN.7 West of Stover, and south of Water St.	17	440	6	434	240,000
STN.8 10 feet south of STN 7	139	1178	128	1050	24,000,000
STN.9 Foot of Church St.	46	514	22	492	24,000,000

These results indicate that pollution of Otter Creek is taking place throughout Norwich due to domestic wastes being discharged into the storm drains, and consequently into the stream. Local authorities should take steps to eliminate these illegal connections. Sampling of Otter Creek was carried out throughout Norwich. The analyses are to be found at the end of this report.

Otterville:

Several samples were obtained throughout the village, and the sampling points and analyses are attached to this report. The results of the samples reveal that pollution exists in the vicinity of the municipal park below the canning factory and further downstream.

Tip Top Canners:

Mr. E.R. Roberts, Manager of the canning factory was interviewed and he advised that the plant operates from June to November. Peas were being processed during the time of inspection.

Disposal of Wastes - The volume of water used could not be determined since it is obtained from the municipality, a private well, and Otter Creek. Wastes are directed to a concrete tank and pumped to two lagoons. However, it was discovered that the pump used in the operation had failed, and as a result, the wastes were being discharged through an overflow sewer to Otter Creek. The plant manager was unaware of this fact. Samples were obtained at the overflow to the river and submitted to the laboratory for sanitary, chemical and bacteriological analyses.

The results

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	
2,800	5704	340	5364	24,000,000 +

Summary - Following an inspection in September, 1957 it was reported that the lagoons were operating satisfactorily. It was, therefore, disappointing to find that wastes from the plant were being discharged into Otter Creek and creating very serious pollution. This is indicated by the high B.O.D. and bacteriological analysis. The company should ensure that untreated wastes from the plant are not discharged into a watercourse in the future.

Otterville Summary:

Analyses of samples obtained throughout the village indicated that a deterioration in the sanitary quality of Otter Creek takes place in the area below the Tip Top Cannery. There is a possibility that certain private premises are discharging septic tank effluents into the stream in this vicinity. It is suggested that local authorities carry out investigations in cooperation with the Oxford County Health Unit to determine the presence of drains discharging domestic wastes into the stream.

Tillsonburg:

Arrangements have been completed between the Town of Tillsonburg and the OWRC for the construction of a sewage treatment plant. A survey of storm sewers was carried out to determine the presence of domestic wastes in the flow. Industries that were not connected to the existing sanitary sewers were also investigated.

Storm Sewers:

Fifteen storm sewer outlets were located, with eight sewers carrying no flow at the time of inspection. The location of the outlets are shown on an accompanying map of Tillsonburg. Descriptions of the outlets, together with the analyses of samples taken, are listed as follows:

Location	B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
		Total	Susp.	Diss.	
	(ppm)	(ppm)	(ppm)	(ppm)	
ST1 Near Pumping Station above Niagara St.	204	482	34	448	2,400,000
ST2 Concession St. at bridge (no flow)					
ST3 Foundry & Elgin Sts., near refuse dump.	1.7	336	52	284	240,000
ST4 Simcoe St. storm sewer	1.2	344	24	320	24,000
ST5 East side Lisgar Lake (no flow)					

	B.O.D.	Solids		Diss.	Coliforms
		Total	Susp.		
ST6 East of Lindsay St. and Tilson Av. (no flow)					
ST7 Bloomer St. - north side (no flow)					
ST8 Hale St. - west side - (no flow)					
ST9 Harvester Co. drain - not operating					
ST10 End of Victoria St. (no flow)					
ST11 Arena drain - discharges into a creek south of Glendale Drive	8	532	20	512	240,000
ST12 N.W. of Arm St. from Victoria Street (no flow)					
ST13 Stoney Creek at Brock St.	1.6	484	18	466	24,000
ST14 Maple Lane outfall at Hyman St.	0.7	398	18	380	2,400
ST15 Sewers from Otter Valley and Keewaddin Dairies.					

Summary - The analyses of samples taken of storm drain effluents reveal that a considerable amount of pollution is entering the receiving stream from these drains.

Otter Valley Cooperative Dairies:

Mr. C. Robb, manager of the milk processing plant, advised that arrangements were being made to include the dairy in the town's proposed sewerage scheme.

Disposal of Wastes:

Wastes from the dairy are discharged into a catch basin on the north side of Concession Street, about 80 yards south of the plant. The Keewadin Dairy also discharges wastes into this catch basin. A drain leads from the basin to the south end of Concession Street and discharges into a ditch near the C.P.R. bridge. The wastes enter Otter Creek in this area. Six catch basins are located on Concession Street about 300 feet apart. These basins serve as clean-outs in the event of drain blockage.

Samples obtained at the drain outfall revealed:

B.O.D.	Solids			Coliforms
(ppm)	Total	Susp.	Diss.	(M.P.N.)
1870	1482	284	1198	-

Summary - The analyses indicated heavy pollution.

Keewadin Dairy:

Mr. M. Seymour, owner and manager of the milk pasteurization plant was interviewed.

Disposal of wastes - As previously noted, milk wastes are discharged into a catch basin on Concession Street, and together with wastes from the neighbouring dairy are discharged into Otter Creek. A septic tank and a field tile system are used for the disposal of sewage from the plant.

Summary - Mr. Seymour reported that the dairy wastes would be treated at the proposed new sewage treatment plant, and that connections to the town's sewers would be made as soon as practicable.

Borden Dairy:

Mr. J.H. Mannell was interviewed in the absence of Manager J.H. Baird. The plant manufactures evaporated milk.

Disposal of Wastes - Wastes resulting from cleaning operations are discharged into Otter Creek.

Summary - Wastes from the company's dairy will be treated at the proposed new sewage treatment plant when completed.

Tillsonburg Summary:

The town has entered into an agreement with the OWRC for the construction of a modern sewage treatment plant. Industries not connected to the existing sanitary sewers, namely the Otter Valley Cooperative Dairies, the Keewadin Dairy and the Borden Company plant, were advised to ensure future treatment of plant wastes by entering the new sewerage project.

The storm sewers in the town were also found to be sources of pollution. Laboratory examinations of the samples obtained at the storm sewer outlets indicated that there might be a large number of illegal connections from private premises.

Newark Cheese Factory, Norwich North Township

The cheese factory is owned by Blantyre Dairies, 1112 Queen Street East, Toronto. Manager Lloyd Peat was interviewed during the inspection of the plant.

Disposal of Wastes - Whey from the manufacture of cheese was reported to be sprayed on the road by means of a tank truck. Wastes resulting from cleaning operations are discharged through a septic tank and a field tile disposal unit. It was found that a drain was discharging plant wastes into a ditch, which in turn, discharged into a tributary of Spider Creek. The receiving stream was found to be grossly polluted in the vicinity of the ditch carrying cheese factory wastes. These wastes were evident for some distance downstream.

Summary - During the September, 1957 inspection of the plant, cheese was not being processed and it was reported that wastes from the plant were not permitted to discharge into a watercourse. However, it is now evident that a considerable amount of cheese factory wastes is reaching the stream, and it is essential that an approved method of waste disposal be adopted. There appears to be adequate land space in the immediate vicinity of the factory, and it is recommended that a spray irrigation system of waste disposal be considered.

Reynold's Creek:

Domestic and industrial wastes were being discharged into the creek.

Mount Elgin Cheese Factory:

Manager R. Harvey reported that milk received at the plant was shipped to other centres and that the manufacture of cheese had been discontinued.

Disposal of Wastes - Wastes from cleaning operations are discharged through a septic tank to the Mount Elgin storm drain which discharges into Reynold's Creek.

Summary - Consideration was being given by company officials to the installation of a new septic tank and field tile system. In the event that the factory is again employed in the manufacturing of cheese it is unlikely that such a system will be adequate. A spray-irrigation system would be preferable and it is recommended that the company acquire land to adopt the latter method of waste disposal. Samples obtained in the vicinity of the storm sewers revealed:

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	(M.P.N.)
2.1	418	120	298	24,000

It was reported that domestic wastes from Mount Elgin were also permitted to enter the storm drain.

Verschoyle Cheese Factory, Dereham Township

This milk receiving plant is operated by the Borden Company of Ingersoll.

Disposal of Wastes - Wastes resulting from cleaning operations are discharged into a septic tank and finally through a drain to Reynold's Creek. The drain outlet was located on the farm of Mr. E. Bowman, where heavy pollution was present at the receiving ditch.

Summary - The results of samples submitted to the Commission's laboratory revealed:

B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
	Total	Susp.	Diss.	
(ppm)	(ppm)	(ppm)	(ppm)	(M.P.N.)
5.6	306	16	29	2,400,000

Plant wastes should not be permitted to discharge into a watercourse and it is suggested that consideration be given to the adoption of a spray irrigation type of wastes disposal.

Brownsville, Dereham Township:

A survey of pollution conditions in the municipality revealed

that several premises were discharging domestic wastes into a watercourse. This in turn flows into a tributary of Catfish Creek in Elgin County. The private outlets were particularly evident in the south west section of Brownsville. The village has one storm drain which discharges into the stream. Samples were obtained at the outlet and at various points on the watercourse. The laboratory results revealed:

<u>Place</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u>			<u>Coliforms</u> (M.P.N.)
		<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
		(ppm)	(ppm)		
Drain Outlet	15	716	26	690	240,000
63 Creek above municipal drain	3	468	8	460	2,400,000
64 Below municipal drain	3.2	378	8	370	240,000
65 At bridge south of village	3.4	452	14	438	24,000

Summary - Several complaints have been received by local Health Officials of sewage being discharged into the creek flowing through Brownsville. Mr. I. Charlton of the Oxford County Health Unit has carried out investigations of private drains discharging sanitary wastes to the village creek. The property owners will be required to install proper disposal systems.

Culloden Cheese Factory, Dereham Township:

The milk receiving station is owned by Mr. D.C. Murphy of Delhi. Mr. C. Richmond advised that the manufacture of cheese had been discontinued for several years, and that milk received at the plant is weighed and pumped directly into a tank truck and shipped to other centres.

Disposal of Wastes - Wastes resulting from cleaning operations are discharged into a four-compartment septic tank (27' x 6' x 7') and a field tile system. There was no evidence of wastes entering Stoney Creek, which flows at the rear of the plant. This is understandable since the total water consumption was estimated at 100 gallons per day. Sanitary wastes are discharged into a separate septic tank and field tile system.

Summary - The cheese factory does not appear to have a pollution problem at the present time.

THAMES RIVER

Sample Points and Analyses

<u>Mileage Sampling Points</u>	<u>Location</u>	<u>B.O.D. (ppm)</u>	<u>Solids</u>		<u>Diss.</u>	<u>Coliforms (M.P.N.)</u>
			<u>Total</u>	<u>Susp.</u>		
T146.0	At Putnam Rd. bridge	4.6	458	16	442	2,400
T148.4	Below Ingersoll at Water Works Road	4.4	456	42	414	24,000
T156.4	At Beachville	6.6	430	58	372	24,000
TC160.9	Cedar Creek just before junction with Thames at Hwy.#2 west side of Woodstock	2.1	338	4	334	24,000,000 +
T162.2	Bridge on Hwy.#19 north of Woodstock	2.1	532	40	492	24,000
TC162.3	Cedar Creek above Victoria Park, Woodstock	2.2	354	8	346	2,400
T166.2	Bridge 2 miles south of Innerkip	2.5	484	54	430	240
T183.7	Bridge on Hwy.#19 S.W. of Tavistock	2.7	508	10	498	2,400,000
TS181.6	Shakespeare Creek N. of Maplewood Rd. at concession 14.	2.1	354	22	332	2,400
TS183.9	Shakespeare Creek at Huron Rd. East of Tavistock	1.6	378	18	360	2,400
TT184.6	Tavistock Creek at Concession Rd. 12	2.4	382	10	372	240
TPH173.5	Phelan Creek at Concession Rd. 15	2.0	492	28	464	2,400

Middle Branch of Thames River

T.M.146.4	East of Village of Banner	4.8	338	26	312	2,400
T.M. 161.3	Embro Creek - 1st side road south of embro	0.5	436	50	386	2,400
T.M.162.7	Embro Creek - N. of embro 4th Concession	1.0	406	12	394	2,400

Middle Branch of Thames River (Cont'd)

<u>Mileage Sampling Points</u>	<u>Location</u>	<u>B.O.D. (ppm)</u>	<u>Solids Total Susp. Diss. (ppm)</u>			<u>Coliforms (M.P.N.)</u>
TMB 164.4	Bennington Creek at Braemar Rd. west of C.P.R.	0.8	446	20	426	240
<u>Oxford County Sampling Point No.</u>						
1.	Uniondale Creek above cheese factory drain 0.6		328	8	320	240
2.	Uniondale Creek below cheese factory drain 1.1		384	84	300	2,400
3.	Bennington Creek above cheese factory drain. -	-	-	-	-	24,000
4.	Bennington Creek below cheese factory drain -	-	-	-	-	24,000,000+
10.	Phelan Creek at Hickson 50 yds. above Borden plant drain	-	-	-	-	2,400,000+
11.	Phelan creek at Hickson 30 yds. below Borden Plant drain 69.0		568	60	508	240,000
14.	German Union cheese factory 20 yds. above- factory drain		-	-	-	240,000
15.	German Union cheese factory 30 yds. below factory drain					2,400,000
17.	At creek, 2 mi. south of Cassel point, 160-yds. below cheese factory outlet 1.8		350	36	314	240
18.	At creek above Cassel cheese factory outlet 9.0		404	92	313	2,400,000
19.	Horner's Creek below junction of creek from cheese factory 1.2		396	10	386	24,000

Oxford County
Sampling

<u>Point No.</u>	<u>Location</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u> <u>Total Susp. Diss.</u> (ppm)			<u>Coliforms</u> (M.F.N.)
20.	Horner's Creek 1 mi. w. of Bright Hwy.#69	4.6	422	130	292	2,400
21.	East branch of Nith River N. of Platts- ville	0.6	306	14	292	240
22.	E.branch of Nith River south of Plattsville	4.4	354	44	310	2,400
25.	Nith River west branch before joining East Branch	2.4	382	12	370	2,400
26.	Nith River below junction of east and west branches south of Plattsville	3.2	384	20	364	240
27.	Washington Creek at West entrance to Washington	1.1	342	14	328	2,400
28.	Washington Creek - 300 yds. south of village	4.2	506	162	344	2,400
29.	Washington Creek at 12th Conc.Blenheim Twp.	0.9	378	10	368	24,000
30.	Creek from New Dundee before joining Nith River	1.6	424	26	398	2,400
31.	Nith River - above junction with new Dundee Creek	2.6	382	14	368	240
32.	Nith River - near East boundary of Oxford County	2.9	456	46	410	240
33.	Horner's Creek at Hwy. #2 Princeton	3.4	502	8	494	24,000,000 +
34.	Creek from Burgess Lake south-west of Drumbo					2,400
41.	Reynold's Creek - above municipal drain - Mt. Elgin	2.6	440	30	410	24,000
42.						

Oxford County
Sampling

<u>Point No.</u>	<u>Location</u>	<u>B.O.D.</u> (ppm)	<u>Solids</u> <u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	<u>Coliforms</u> (M.P.N.)
42.	Reynold's Creek below municipal drain - Mt. Elgin	2.1	418	120	298	24,000
43.	Reynold's Creek - 2 mi. s.of Verchoyle	2.1	376	62	314	24,000
51.	Otter Creek at bridge Court St. W. Norwich	5.4	420	448	372	240,000
52.	Otter Creek at bridge Main St. above broom factory Norwich	1.6	324	22	302	24,000
53.	Otter Creek below broom factory outfall Norwich	2.2	360	42	318	24,000
54.	Otter Creek at Pitcher St. bridge Norwich	2.6	426	48	378	240,000
55.	Otter Creek at Stover St. bridge Norwich	1.8	338	6	332	240,000
56.	Otter Creek 1/4 mile S.E. from Norwich	2.4	356	16	340	2,436,000,000
57.	Otter Creek 1/2 mile S.E. of Norwich	3.2	452	98	354	2,400
58.	Otter Creek at Municipal Park, Otterville	3.1	422	98	324	2,460,000
59.	Otter Creek at dam, Otterville	3.2	432	100	332	2,400,000
60.	Otter Creek at Hwy.#59 above Otterville	1.3	374	48	326	2,400
61.	Otter Creek, 3/4 miles south of Otterville	3.4	434	40	394	240,000
62.	Otter Creek 1/4 mile south of Otterville	3.5	372	30	342	broken in transit.
75.	Otter Creek near Hwy. bridge at East entrance to Tillsonburg	7.2	460	82	378	240,000
76.	Otter Creek at Simcoe St. bridge, Tillsonburg	2.2	432	76	356	240,000

Oxford Sampling Point No.	Location	B.O.D. (ppm)	Solids			Coliforms (M.P.N.)
			Total	Susp.	Diss.	
77.	Otter Creek at Van St. bridge Tillsonburg	3.0	408	24	384	24,000
78.	Otter Creek above municipal sewage settling tank-Tillson- burg.	2.7	470	120	350	240,000
79.	Otter Creek below municipal sewage settling tank - Tillsonburg	12.0	422	96	326	2,400,000
80.	Otter Creek below Borden Plant drain outfall, Tillsonburg	12.0	422	86	336	240,000
81.	Creek entering Otter Creek, West of municip- al sewage tank outlet - Tillsonburg	13.0	508	56	452	2,400

STREAM POLLUTION IN THE COUNTY
OF OXFORD

Summary of Report

A sanitary survey of the municipalities of Embro, Hickson and Tavistock in the northern section of the County revealed that domestic wastes were being discharged into municipal storm sewers creating pollution conditions in the receiving watercourses.

Several cheese factories were found to be serious sources of pollution. Wastes from these plants were discharged directly or with partial treatment into the streams. It was learned that the Bright Cheese and Butter Company was the only factory that had installed a satisfactory system of waste treatment. Other industries in the northern section of the County that did not provide adequate treatment of industrial wastes were the J.G. Field Company and the Tavistock Dairy.

Laboratory examination of samples obtained from the south branch of the Thames River in the vicinity of Woodstock, Beachville and Ingersoll revealed that these municipalities were contributing to the pollution of the river. In Beachville, it was found that the Neilson Company milk plant was a serious offender, while a sanitary survey of the Town of Ingersoll indicated that the municipal storm sewers and several industries were major sources of pollution.

An investigation of the middle branch of the Thames River revealed that the Red Stars Cheese Factory and the Homestead Dairy were discharging harmful wastes into the river. A laboratory analysis of the Canada Cement Company plant effluent revealed that more adequate treatment was desirable.

Immediately south of Woodstock, it was found that the Donland's Dairy (Oxford) Limited plant was a source of pollution. This waste is discharged into Cedar Creek.

Heavy pollution of Otter Creek was evident in Norwich, with domestic wastes being discharged into the stream from the municipal storm sewers. It is expected that the Canada Vinegars Limited will have introduced the spray-irrigation method of waste disposal before the beginning of operations in September 1958. The other Norwich industry, the West Taylor Bickle Company, is to provide complete treatment of plant wastes. At Otterville the Tip Top Cannery were found to be discharging wastes into the stream. Lagoons are provided for the treatment of the factory wastes, but due to the mechanical failure of the pumping equipment, the wastes were being by-passed to Otter Creek.

Spider Creek, which enters Otter Creek south of Otterville, receives wastes from the Dereham Centre and the Newark Cheese Factories,

At Tillsonburg heavy pollution of Otter Creek resulted from inadequate treatment of sanitary and industrial wastes. It is expected that with the completion of the proposed new sewage treatment plant complete treatment will be provided for the sanitary and industrial wastes from the town.

Recommendations:

As a result of this survey, it is recommended that -

1. The nine cheese factories, the J.G. Field Company knitting mill, and the Tavistock Dairy in the County's northern section provide adequate treatment of all wastes before they are discharged into the streams;
2. Ingersoll industries provide adequate treatment of industrial wastes, and that town officials renew efforts to have all homes on sewered streets connected to the sanitary sewers.
3. The Village of Norwich take steps to eliminate connections from private dwellings and business premises to storm drains.
4. Norwich industries provide satisfactory treatment of the wastes before discharge into Otter Creek.
5. The Tip Top Cannery take steps to prevent the discharge of wastes to Otter Creek.
6. The three milk industries in Tillsonburg provide treatment of wastes at the proposed new sewage treatment plant, or, if this is not feasible then by private means.
7. The five cheese factories in the southern section of the County provide satisfactory treatment of wastes.
8. Where it is not feasible for small municipalities to provide sewage works, a survey be made by Oxford County Health Unit officials to ensure that individual sewage treatment units serving private residences are satisfactory and are not discharging raw or partially treated sanitary wastes to storm sewers, drains, ditches or watercourses.

SUMMARY

OXFORD COUNTY POLLUTION SURVEY
AUGUST 1958

The following comparisons are made between the conditions found in the 1957 survey and those of the 1958. A tabulation of work yet to be done is shown --

Municipality or Area	1957 Survey	1958 Survey	Correction required
East Nissouri Twp.	--	--	--
Uniondale Cheese factory, R.R.#1 Lakeside.	factory drain contributing pollution.	milk wastes evident at outfall.	wastes should not enter creek.
Homestead Dairy R.R.#3, Thamesford,	--	Pollution evident at factory drain outlet.	Wastes should not enter creek use spray irrigation.
Thamesford	--	No pollution.	None.
West Zorra Twp. Bennington Cheese factory, R.R.#3 Embro.	Pollution evident at drain outfall.	No change.	No wastes to creek use spray irrigation.
Embro.	No pollution evident at time of survey.	Sanitary wastes are being discharged into storm drains.	Investigation of private connections being carried out by Health Unit.
Embro slaughter house.	--	Outlet to river blocked.	None.
Embro Refuse Dump,	--	No pollution problem at present.	Local officials should super- vise dump.
Red Star Cheese factory, R.R.#4 Ingersoll.	Sewage & Indus- trial waste entering river.	No change.	Should intro- duce approved method of waste disposal No water should enter river.

Municipality or Area	1957 Survey	1958 Survey	Correction required
Canada Cement Co. plant, #4, Woodstock.	Jackson drain excessive turbidity.	Solids & turbid- ity still high.	None stated.
East Zorra Twp. Tavistock.	-- Health Unit reported private homes connected to storm drains.	-- Same report.	-- None stated.
Tavistock Cheese & Butter Co.	Heavy pollution exists at factory drain outlet.	No improvement.	Wastes should not be entering creek. Use spray irriga- tion.
J.G. Field & Co. Ltd.,	Wastes entering storm sewer are inadequately treated.	No improvement.	None stated.
Tavistock Dairy.	--	Pollution evident at dairy drain outlet.	No wastes to creek - use spray irrigation.
Hickson Storm drains.	Wastes from private homes and slaughter house entering drains.	Wastes from private homes entering drain slaughter house ok.	Health Officials continue investi- gations of private homes.
Borden Cheese Co. Hickson	factory wastes enter creek and cause heavy pollution.	No improvement.	No wastes should enter creek - adopt approved method of disposal.
Innerkip	No pollution problems.	No pollution problems.	None.
Cassel Cheese & Butter Co., R.R.#1, Tavistock.	Industrial wastes discharged into Thames River causing pollution of same.	No change.	No wastes to River - use spray irrigation.
German Union Cheese factory R.R.1, Tavistock.	Wastes being discharged into tributary of Horner's creek causing pollution.	No change.	No wastes should enter creek. Spray irrigation recommended as satisfactory method of waste disposal.

Municipality or Area	1957 Survey	1958 Survey	Correction Required
Blanford Twp. Bright.	No pollution from homes evident.	No pollution from homes evident.	None.
Bright Cheese & Butter Co.,	Wastes discharged into Horner's Creek causing pollution.	Spray irrigation recently intro- duced.	Spray system to be further investiga- ted as installation was still incomplete.
BLENHEIM TWP. Canada Sand Paper Co. Plattsville.	Plant wastes entering Nith River are a source of pollution.	Plant wastes are diluted but as operations had ceased for the day its effect could not be determined. Wastes enter drains to Nith River.	Future investiga- tions should be made to determine effect of dilution during time of operation.
Washington.	Pollution of stream joining Nith River caused by homes discharging wastes into it.	No change.	Homes should not be allowed to discharge wastes into creek.
Drumbo.	Some 40 private dwellings are reported to be connected to storm drain.	There appeared to be a pollution problem from private dwellings.	None Stated.
Princeton.	No pollution problem.	No pollution problem.	None.
Norwich North and Dereham Twps. Donland's Dairy, Oxford Ltd.,	Pollution evident at dairy drain outlet in Cedar Creek.	No change.	A satisfactory method of waste disposal, (i.e. spray irrigation) should be intro- duced immediately.

Municipality or Area	1957 Survey	1958 Survey	Correction Required
York Farms Pea Vining STN. North Norwich Twp.	Seepage from pea stack polluting watercourse.	Operations have been discontinued.	None.
Woodstock Woodstock S.T.P.	Results of analyses of samples satis- factory.	Results of analyses of samples were satisfactory.	None.
Chemical Lime Ltd.,	Not discharging wastes into river.	Not discharging wastes into river.	None.
North American Cyanamide Ltd.	No major problem in waste disposal.	No discharge into Thames River during inspection.	Samples to be obtained when Co. drain is flowing.
Gypsum, Lime & Alabastine Ltd.	No major problem in waste disposal reported.	Effluent at outlet into Thames River indicates that suspended solids are higher than OWRC standards.	Further sampling of outlets from Company quarries desirable.
Neilson Co.,	Discharging diluted milk wastes into river.	Pollution evident at dairy drain outlet.	Wastes should not enter River.
Ingersoll W.M. Stone & Sons Ltd.,	Industrial and sanitary wastes entering river.	Rendering operations are to cease at the plant in Aug./58	None.
Morrow Screw & Nut Co.,	Industrial wastes being discharged into river.	All four plants are discharging harmful wastes into the Thames River.	Further investi- gation by OWRC industri- al waste division should be carried out.
Oxford Dairy	--	Harmful wastes are being discharged into the town sewer.	Dairy wastes should be included in municipal sewerage system.

Municipality or Area	1957 Survey	1958 Survey	Correction Required
Ingersoll Cheese Co. Ltd.,	Wastes entering river.	Industrial wastes are treated and discharged into Thames River.	Samples to be obtained to determine efficiency of treatment.
The Borden Co.,	High B.O.D. entering river.	Analyses of samples indicate a high B.O.D. at plant outlet to the Thames River.	Wash water should be separated from boiler water so milk washings do not enter river.
Ingersoll Tool & Machine Co. Ltd.,	Cyanides and oils entering river.	Have recently installed wash treatment equipment.	Investigations not yet completed by Ind. Waste Division.
Ingersoll Storm Sewers.	Many connected to sanitary sewer.	A high percentage of premises connected to the drain.	Local authorities should take steps to eliminate connections to storm sewers.
Otter Creek - West Taylor Bickle Company, Norwich.	Pollution in area of factory drain outfall.	Both sanitary and industrial wastes are discharged into creek.	Proper method of waste disposal should be adopted.
Canada Vinegars Ltd., Norwich.	Treatment inadequate - harmful wastes entering creek.	Installing spray irrigation before 1958 operations begin.	Plant to be re-visited after spray irrigation installed.
Norwich Storm Sewers.	Sewage wastes being discharged into storm sewer.	No change.	Local authorities should eliminate illegal connections.
Tip Top Cannery, Otterville.	Have satisfactory lagoon system of waste disposal.	Wastes were being discharged through an overflow sewer into creek.	Plant officials should ensure that wastes are treated and not by-passed.
OTTERVILLE	Sanitary wastes from private homes entering creek.	Same report.	Local authorities should determine presence of drains discharging into creek.

Municipality or Area	1957 Survey	1958 Survey	Correction Required
Tillsonburg	Storm sewer discharge directly into creek. Sanitary sewers directed to municipal settling tank.	Effluent from storm drains polluted. S.T.P. to be constructed.	None Stated.
Otter Valley Co-Operative Daires, Tillsonburg.	Heavy pollution at drain outlet.	No change.	This factory should connect to sewers when they are completed.
Keewadin Dairy, Tillsonburg.	Heavy pollution at dairy catch basin.	No change.	Dairy is planning to connect to sanitary sewer when completed.
Borden Dairy.	Wastes being discharged into creek are a source of pollution.	No change.	Dairy wastes to be treated at new S.T.P.
Dereham Centre Cheese Factory.	Wastes normally enter Spider Creek but no flow during inspection.	--	Wastes should not enter creek.
Newark Cheese Factory, Norwich North Twp.	No wastes were reported to be entering creek.	Factory wastes entering tributary of Spider Creek causing pollution.	No wastes to creek - use spray irrigation.
REYNOLD'S CREEK Mount Elgin Cheese factory.	factory wastes entering storm sewer to Reynold's Creek.	No change.	No wastes to storm drain. Spray irrigation recommended.
Verschoyle Cheese Factory.	Wastes from factory being discharged into Reynold's Creek via storm drain.	No change.	No wastes should enter creek - use spray irrigation.
Brownsville, Dereham Twp.	Sewage is being discharged into storm drain.	Some private connections removed from drain.	Investigations by Oxford Health Unit continuing.
Culloden Cheese Factory, Dereham Twp.	--	No pollution problem at present time.	None.

